Canadian Centre for Occupational Health and Safety

Centre canadien d'hygiène et de sécurité au travail

WORKING IN A STANDING POSITION

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PREFACE

This publication is part of a series on ergonomics. It is prepared as a source of information for health and safety committees and others in the workplace with an interest in understanding and reducing the occupational risk of working in a standing position. ERGONOMIC INFOGRAMs are available separately for display in the workplace.

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1. THE PROBLEM

Working in a standing position on a regular basis can cause sore feet, swelling of the legs, varicose veins, general muscular fatigue, low back pain, stiffness in the neck and shoulders, and other health problems. These are common complaints among salespeople, machine operators, assembly line workers and others whose jobs require prolonged standing.

Standing is a natural human posture and by itself poses no particular health hazard. But standing while working is different from standing while not working.

While working, the body's position is affected by the arrangement of the work area and by the various tasks which have to be performed. Sometimes the worker is obliged to adopt unnatural positions and to hold them over time. Body positions are determined by the physical layout of the workstation, the tools, and the placement of keys, controls and displays that the worker needs to operate or observe. Consequently, the number of body positions available is limited, and the positions themselves are more rigid and unnatural, giving less freedom to move around and rest working muscles. It is this inflexibility of body positions that contributes to health problems.

These conditions commonly occur where the job is designed without consideration of human body characteristics. When the job design ignores the basic needs of the human body, work can cause discomfort in the short term, and can eventually lead to severe and chronic health problems.

2. HEALTH HAZARDS

Keeping the body in an upright position, even while standing motionless, requires a considerable muscular effort that is particularly unhealthy. It effectively reduces the blood supply to the loaded muscles. Insufficient blood flow accelerates fatigue and causes pain in the muscles of the legs, back and neck--the muscles used to maintain an upright position.

The worker suffers not only muscular strain, but other discomforts also. Prolonged and frequent standing causes blood to pool in the legs and feet. When this occurs continually, it results in inflammation of the veins and, eventually, in chronic and painful varicose veins.

Excessive standing also causes the joints in the spine, hips, knees and feet to become temporarily immobilized or locked. This can later lead to rheumatic diseases due to degenerative damage to the tendons and ligaments, the structures that bind muscles to bones.

3. RECOMMENDATIONS

To improve jobs that involve prolonged standing, concentrate on three areas of design: workplace design, job design, and work practices.

Workplace Design

In a well-designed workplace, the worker has the opportunity to choose from among a variety of well-balanced working positions and to change between them frequently.

Working tables and benches should be adjustable. Adjustability for working height is particularly important in order to match the workstation to the worker's individual body size and to the worker's particular task. Adjustability ensures that the worker can carry out work in well-balanced body positions.

If adjustability is not built-in, then there need to be other ways of matching the height of the workstation with the worker's dimensions. Platforms to raise the shorter worker or pedestals on top of workstations for the tall worker should be considered.

Space organization is another important aspect of workplace design. There should be enough room to move around and to change body position. Providing built-in foot rails or portable footrests allows the worker to shift body weight from one leg to the other. Elbow supports for precision work help reduce tension in the upper arms and neck. Controls and tools should be located so that the worker can reach them easily, without twisting or bending.

Where it is possible, a seat should be provided so that the worker can do the job either sitting or standing. The seat must place the worker at a height which suits the type of work being done. For work which requires standing only, a seat should be provided in any case to allow the worker to sit occasionally. Seats at the workplace expand the variety of possible body positions, giving the worker more flexibility.

The benefits from greater flexibility and a variety of body positions are twofold. The number of muscles involved in the work is increased, equalizing the distribution of loads on different parts of the body. Then there is less strain on the individual muscles and joints used to maintain the upright position. At the same time, changing body positions improves the blood supply to the working muscles. Both effects contribute to the reduction of overall fatigue.

Quality of footwear and type of flooring materials are also major factors contributing to standing comfort. For further details on these subjects, refer to the appendices of this publication.

Job Design

The basic principles of good job design for standing work are as follows:

- Change working positions frequently so that working in one position is of a reasonably short duration.
- Avoid extreme bending, stretching and twisting.
- Pace work appropriately.
- Allow workers suitable rest periods to relax; exercises may also help.
- Provide instruction on proper work practices and the use of rest breaks.
- Allow workers an adjustment period when they return to work after an absence for vacation or illness so they can gradually return to a regular work pace.

For further information on job design, please contact CCOHS.

Work Practices

A well-designed workplace combined with a well-designed job make it possible to work in a balanced position without unnecessary strain on the body. Although the actual performance of the task depends on the worker, work practices or individual work habits, including how the worker stands, moves or lifts, can make the job safer or more hazardous.

Individual work habits are shaped by proper training and by a supervisor who encourages the worker to use the skills they have learned.

It is important that the worker is informed of health hazards in the workplace. The worker needs to understand which body movements and positions contribute to discomfort, and that the conditions that cause mild discomfort can lead to chronic injury in the long term. Worker training should also contain information on how to adjust specific workplace layouts to the individual's advantage in order to reduce or eliminate health hazards.

The worker should be aware that rest periods are important elements of the work. Rest periods should be used to relax when muscles are tired, to move around when muscles are stiff, to walk when work immobilizes the worker, and so on.

The worker should also be encouraged to report discomforts experienced during work. It may result in correcting working conditions.

All these elements--training and supervision, coupled with active worker input--can result in sound work practices.

It must be remembered that a well-designed job and workplace are essential to healthy and safe work. Without these, good work practices cannot be effective.

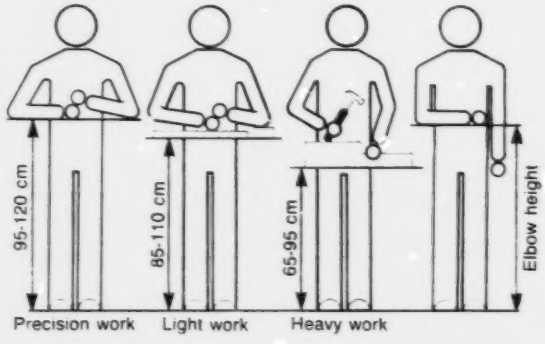
APPENDIX A

Standing in the Workplace

Workplace design should accommodate the variety of workers' shapes and sizes and provide support for the completion of different tasks.

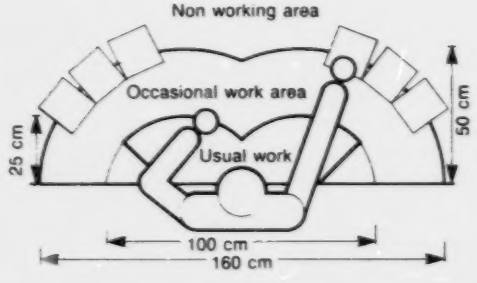
Different tasks require different work surface heights:

- precision work, such as writing or electronic assembly - 5 cm above elbow height; elbow support is needed.
- light work, such as assembly line or mechanical jobs - about 5-10 cm below elbow height.
- heavy work, demanding downward forces - from 20-40 cm below elbow height.

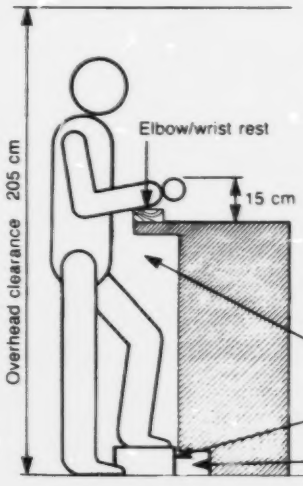


DOs

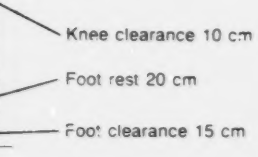
- ADJUST the height of the work surface according to your dimensions. Use elbow height as the guide.
- ORGANIZE your work so that the usual operations are performed within easy reach.



- FACE the object that you work with at all times.
- KEEP your body close to the work.



- ADJUST the workplace to get enough space to change working position.
- USE a footrail or portable footrest to shift body weight from both to one or the other leg.



- USE a seat whenever possible.
  - while performing your job, or
  - at least occasionally when the work process allows for rest. Refer to ERGONOMIC INFOGRAM No. E-Z02.

DO NOTs

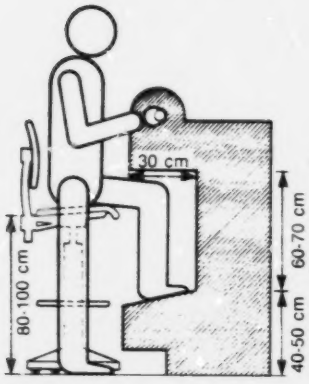
- DO NOT REACH behind the shoulder line. If needed, shift feet to face the object.
- DO NOT OVEREXTEND your reach beyond the point of comfort.
- DO NOT REACH above shoulder height.

APPENDIX B
Sitting and Standing in the Workplace

Continuous standing or sitting while working is a common source of discomfort and fatigue.

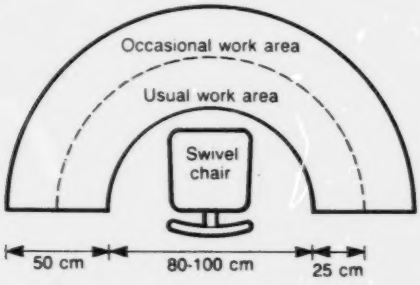
Frequent changes of body positions, including sitting and standing, helps to avoid fatigue.

WORKSTATION FOR SIT/STAND



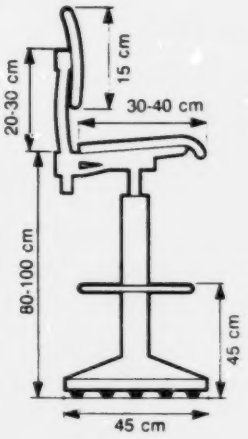
- ADJUST workstation to the proper height. Refer to ERGONOMIC INFOGRAM No. E-A01.
- USE a swivel chair with an adjustable seat height.
- ADJUST the chair seat height to 25-35 cm below the work surface.
- USE a footrest with a height of 40-50 cm.

SEMI-CIRCULAR WORKSTATION



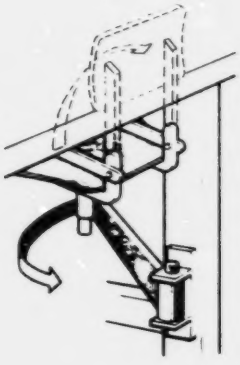
- ARRANGE work in a semi-circle.
- USE a swivel chair:
  - to reduce body twisting
  - to allow easy movements
  - to reduce side-to-side motions.
- USE sloping work tables wherever possible:
  - to reduce bending
  - to encourage an upright position while sitting or standing.

CHAIR FOR SIT/STAND WORKSTATION

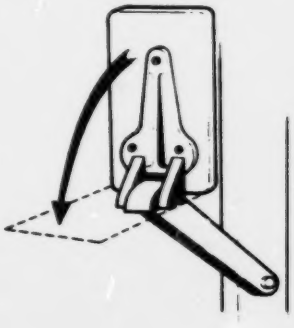


- ENSURE that the seat has a minimum width of 40 cm.
- CHOOSE back rests that are contoured vertically and horizontally.
- USE a seat covering made of non-slip, breathable fabric.
- SELECT a seat padding from 2-3 cm thick.

Wherever possible, a worker should be able to work sitting or standing at will.



- PROVIDE a chair that can fold up and be out of the way where space is limited.
- ENSURE that chairs have a back support.



- PROVIDE a chair for resting purposes even when work can only be done standing.

APPENDIX C
Footwear and Floors

FOOTWEAR

Your feet can only be as comfortable as the footwear permits.

- WEAR shoes that do not change the shape of your foot.

- CHOOSE shoes that provide a firm grip for the heel. If the back of the shoe is too wide or too soft the foot will slip, causing instability and soreness.
- WEAR shoes that allow freedom to move your toes. Pain and fatigue result if shoes are too narrow or too shallow.
- ENSURE shoes have arch supports. Lack of arch support causes flattening of the foot.
- WEAR shoes with lace-up fastenings.
- TIGHTEN the lace instep of your footwear firmly. This prevents the foot from slipping inside the footwear.
- USE padding under the tongue if you suffer from tenderness over the bones at the top of the foot.
- USE a shock-absorbing cushioned insole when working on metal or cement floors.
- DO NOT WEAR flat shoes.
- DO NOT WEAR shoes with heels higher than 5 cm (2 inches).
- CHOOSE footwear according to the hazard at your workplace.
- SELECT safety footwear, if required, that is CSA approved and carries the proper ratings for the hazard. Refer to SAFETY INFOGRAM K03.
- SELECT footwear taking into account individual fit and comfort. Try on and walk in before using.

FLOORS

- KEEP work areas clean.
- AVOID standing on concrete or metal floors. Recommended for standing work are wooden, cork or rubber covered floors.
- ENSURE that the floors are level and non-slippery.
- COVER concrete or metal floors with mats. Slanted edges on mats help prevent tripping.
- DO NOT USE thick foam-rubber mats. Too much cushioning can cause fatigue and increase the hazard of tripping.